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ORIGINAL ARTICLES.

THE PROPHYLAXIS OF OPHTHALMIA NEONATORUM.*

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It is of course not necessary to discuss before the Academy the scientific aspect of ophthalmia neonatorum. If the subject is once opened as to which is the better of the various methods of prophylaxis or treatment that may be employed it will at once divert attention from the main point, i. e., that prophylaxis is efficient and that early treatment is almost absolutely sure in its results. If no other measures were available than a sanitary toilet of the eyes of the child and nitrate of silver properly applied, eyes need not be lost. When, therefore, we learn that of the number of children admitted into the asylums and schools for the blind last year one-quarter had lost their sight from this cause, and that at Overbrook, a suburb of Philadelphia, the average for the past sixteen years was 29% of the whole, it becomes evident that ordinary sanitary precautions are not being employed, and that more effective measures must be taken to control so serious a menace to the well being of our citizens.

The wide-spread nature of this neglect is shown by the census reports of the special commissions for the blind in New York and Massachusetts. In the former state the total number of

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blind persons reported was 6,200. Of these 569 were under 1 year of age, and under 4 years including those under one year were 959 children, while in the state of Massachusetts among 3,306 blind registered, 661, or more than 20%, had become blind before their 5th year. If we exclude ulcerative conditions due to bad hygiene and insufficient nourishment, and congenital blindness which in many instances may be avoided by preventing the congenitally blind from mating, we may safely assume that one-half of this number, or 10% of the whole, have given their eyes as a tribute to ignorance and neglect. Such figures as these in which so large an amount of blindness is produced every year as the result of an infection that should never have occurred emphasize first, the necessity of a clear understanding of the conditions producing these infections and second, the necessity of an organized and concurrent movement for their control.

Said Dr. Joseph Price, of Philadelphia, a week ago, in discussing this subject at a meeting of the American Obstetrical and Gynecological Association: "The place to begin in the prevention of ophthalmia neonatorum is with the man who gives gonorrhœa to his wife, for in 60% of the cases the gonococcus is found." Every young woman is entitled to know the danger which she incurs both for herself and her future children when her husband brings to her so virulent an infection.

"The important thing," said Dr. Juan Santos Fernandez, of Havana, "is to bring before the public mind by means of constant propaganda knowledge of the danger to a recently born child who is at all affected as to the eyes, the great harm which a husband affected with gonorrhœa may cause his wife or offspring and side by side with these to call the attention of the family to the facilities which the authorities will furnish them to guard against blindness. This," he continues, "would be worth much more than penalties and if there were a physician paid by the state (and in every county in the United States may such a health officer be found) to attend to the poor children affected or to prevent their becoming affected they would surely seek his assistance and he could fulfill his duties."

At a great meeting at Boston said Helen Keller a short time since speaking of blindness due to ophthalmia neonatorum, "The problem of prevention should be dealt with frankly. Physicians should take pains to disseminate knowledge needful for a clear understanding of the causes of blindness. The time for hinting at unpleasant truths is past. Let us insist that the states put

into practice every known and approved method of prevention and that physicians and teachers open wide the doors of knowledge for the people to enter in. The facts are not agreeable reading, often they are revolting, but it is better that our sensibility should be shocked than that we should be ignorant of facts upon which rest sight, hearing, intelligence, morals and the life of the children of men. Let us do our best to rend the thick curtain with which society is hiding its eyes from unpleasant but needful truths."

The second point is to require sanitary decency on the part of those having to do with the parturient woman.

As the distinguished surgeon and citizen of this town, Dr. McMurtry, has said, "Every case of child-birth is a case of surgery."

There is no condition in which a woman can find herself which calls out more helpful sympathy on the part of womankind everywhere than that of pregnancy.

There is no condition which the wives and mothers of the poor find more deplorable than that of child-birth.

Compelled by motives of economy they seek in the hour of their trial the aid of a midwife. She is often untrained and unclean. Listen to the description given by Elizabeth Crowell in a recent number of *Charities and the Commons of the Midwives of New York*. Of an Italian midwife whom she visited she writes: "Her home was of the dirtiest, the condition of her hands was indescribable, her clothing was filthy, her bag beggared description. As to the midwives' homes 106 were absolutely filthy, as was the clothing and person of the midwife herself. As for the bags and their equipment from a professional standpoint, by far the greater number would make fit decorations for a chamber of horrors. Rusty scissors, dirty string, a bit of cotton, a few corrosive sublimate tablets—old rags and papers—some ergot and vaseline, a gum catheter wired, were the usual contents."

There are a thousand of these women in New York and they were present last year at the accouchement of 43,934 mothers, or 42% of the whole number of births. As a result, says Dr. Jacoby, septic peritonitis is exceedingly common and deaths are frequent.

How much blindness results from ophthalmia neonatorum under such ministrations no one can estimate. But when we find in a home for blind children that 12 out of 16 have lost their

eyes from suppurative inflammations the necessity for urgent action is self-evident.

The first essential then for the betterment of these conditions is broader enlightenment concerning them. It is not a medical subject only—it is one of those forms of disease like tuberculosis which affects the entire community. It is a matter of great social importance and social workers when once the subject is understood will prove to be important factors in effecting its control. But they must know what it is; how it is acquired and how it is avoided. It must be made clear too that infections are not always gonorrhœal, nor do they always occur at the birth of the child. Even physicians sometimes forget to advise the mother and nurse of the danger of a lochial discharge getting into the child's eyes through the use of the same bathwater or sponges that have been used for the mother. It is evident then that two things are necessary. First, a regular and systematic campaign of education carried on through properly constituted authority. This should obviously be the work of the department of public health.

Circulars of advice should be issued from time to time, giving mothers and midwives, in the simplest language, directions as to the necessary precautionary measures that must be taken if dangerous infections of the eyes of the child are to be prevented. This is very generally done by the Valentin Haüy Society in France and the leaflet issued by this organization is one of the best published. It points out the danger to the new born child of infections—the necessity of repeated vaginal douches by the mother up to the time the child is born—the manner in which the child's eyes should be cared for as soon as the head is born and in heavy black letter type is urged the immediate necessity of putting the child under the care of an oculist if the eyes become at all inflamed. Again physicians are not all well informed as to the best methods of treatment to follow. The silver salts are used inadvisedly. When this subject is brought to the department of public health in each state for effective action the first inquiry will be what should be done—and how should it be done?

Would it not be better for this Academy to speak authoritatively rather than to jeopardize the whole movement by the issuance of matter which we might hesitate to endorse?

It would seem at present impossible to eliminate the midwives, desirable as that might be. They are the product of the ages,

but while they continue to do their vitally important work where in every instance two human lives and the child's eyes depend upon their cleanliness—in the interest of humanity and decency this must be secured. They should gradually be replaced by trained physicians and there ought not to be any difficulty in doing this in college towns, from which so many young men go out without adequate obstetrical training.

The second important essential, therefore, would be to put these women under the authority and control of the health boards until gradually as a class they disappear. They should be licensed, registered, kept under strict surveillance and required to register each birth and to report each case of ophthalmia neonatorum within 12 hours after it occurs. They should be advised how to manage the toilet of the eyes of the infant immediately the head is born. They should be supplied with a safe prophylactic by the State Board of Health and carefully advised as to how it should be employed.

Failure to use it and to report that it has been used when ophthalmia follows with loss of or injury to the sight—should subject the offender, when negligence can be shown, to withdrawal of license and fine. Dr. Oscar Elbrecht made the excellent suggestion at the meeting at Detroit that physicians should be delegated by the Health Officer to visit each woman delivered by a midwife to be assured that she and the child were left in a normal condition.

I fear that this would be considered an invasion of personal liberties and would be resented by the more independent and intelligent of our citizens, but it is certainly worthy of consideration.

The conclusions then that would seem to be warranted from the existing conditions are:

First. Responsibility.—That the responsibility for the control of ophthalmia neonatorum rests with the state and should find its expression through the department of public health.

Second. Duty of Medical Profession.—The duty of pointing out its dangers, its prevalence, its prophylaxis and its treatment and suggesting measures for its relief through the proper channels remain with the medical profession.

Third. Propaganda Impersonal but Authoritative.—To wipe out this disease as a cause of blindness the public must be better informed concerning it. They can be reached through various social organizations. The material to be used should come from some authoritative body like this Academy.

Fourth. Legislation.—To accomplish effective work a concerted effort should be made to secure uniform laws governing the midwives in the several states and in federal territory. Laws should be enacted such as already exist in many European countries requiring their examination, licensure and registration. They should be put under the direction and surveillance of the department of public health. Should immediately report every birth and every case of ophthalmia neonatorum when it occurs, as is now done under the Howe Law in many states, and should state upon the birth certificate whether or not a prophylactic was used. In case this statement does not appear then the development of ophthalmia with impairment or loss of sight of one or both eyes of the child without satisfactory explanation should be sufficient warrant for the forfeiture of her license and fine.

If the midwife is to be held responsible for a failure to employ prophylaxis it is only just that a pure and safe preparation be put in her hands. Although neither the special microbicide nor the strength to be used should be specified in any legislative enactment, it would be quite proper for this Academy to speak authoritatively for the guidance of health boards who are sure to seek advice. It should be urged, moreover that health boards require the routine employment of prophylaxis in all lying-in hospitals, almshouses and other public institutions and advise its use in all suspected cases in private practice.

It should be made clear that excessive reaction follows the use of the 2% solution of silver nitrate only when too much of the solution has been employed—as Hubbell has pointed out—or when the salt is impure containing free nitric acid as Alleman, Hiram Wood and others have shown. This was first pointed out by Dr. Squibb and is of great importance. A single drop should be carried on a small glass rod of a solution made from the fused silver, and allowed to fall on the center of the cornea. Silver catarrh will not then follow except in premature infants where the vulnerability is greater—when a weaker solution is safer and better.

The centralization of the authority for the control of the midwives in the State Department of Health would contemplate an examining board and registry for these women in every county of each state. On each of these should be a health officer, a physician whose practice is largely obstetrical if possible. The appointment of these examining boards, if they were constantly stimulated to effective work, would be of great educational value to all practitioners who might otherwise be inclined to become

negligent or indifferent and it is doubtful whether further efforts would be required to keep the members of the medical profession up to a full realization of their duty and responsibility.

REPORTS TO BOARDS OF HEALTH.

For many reasons it might prove burdensome and ineffective to exact from the physician a report of each case of ophthalmia that occurred in his practice, but it would be entirely feasible and the data would be of great value if at stated periods of six months or a year, return post-cards were sent to all persons engaged in the practice of obstetrics, asking for a report on the number of cases of ophthalmia neonatorum that had occurred in their practice during that period, what prophylactic, if any, had been used and with what results in the case of each eye. If upon these cards the value of prophylaxis is emphasized and its employment urged the educational value of this procedure at infinitely small cost would be beyond estimate. It would be eminently desirable too if the department of public health were to insist upon accurate records being kept in all public institutions in which lying-in cases were accepted as to the number of cases of ophthalmia neonatorum, the prophylaxis used and the results. In every one of these cases some prophylactic measure should be required.

ORGANIZATION.

A disease occurring sporadically and which is endemic can be controlled only by organized and concerted effort. It is most important, therefore, in order that no false move be made—that the procedures to be determined upon should originate with the ophthalmologists and obstetricians. Their practicability must be assured by those expert Sanitarians engaged in public health work. Then the measures recommended should be carried out by an organized movement in every state in the Union. A state committee should be appointed and through this should be secured the appointment of a like committee in each county. This latter body would ultimately become the board of examiners for midwives. It would be most desirable if in every instance the local health officer should be a member of this committee. Such a general and concerted effort made throughout the country would in a comparatively short time so limit infections and improve methods of treatment that the disasters following ophthalmia neonatorum would practically cease—that this prolific cause of blindness would be controlled—millions would be saved to the commonwealth and the happiness and efficiency of humanity enormously augmented.

REMARKS
ON
OCULAR SYMPTOMS IN CEREBRO-SPINAL
MENINGITIS.

NOTES BASED ON THE EXAMINATION OF 73 CASES.

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Through the courtesy of the superintendent and staffs of the Glasgow Fever Hospitals, the writer has, within the last few months, had opportunities of investigating the condition of the eyes in a number of cases of cerebro-spinal meningitis. Adding to these a few cases seen elsewhere, the total number of cases examined amounts to 73.

As clinical reports embracing the details of the eye conditions in this disease have not been numerous, it may be of interest to give an account of the symptoms found in the present series of cases.

In each case where possible a complete examination was made, but it will be readily understood that often, especially in young children who were acutely ill, many points had to be omitted.

The series includes cases in all stages of the disease, from acute cases seen on the second day of illness to others which had long before subsided into a state of chronic hydrocephalus. One of the latter cases was first seen in the thirtieth week of the disease. The ages of the patients ranged from 3 months to 47 years.

Eye symptoms of any kind were absent only in 4 cases; of these 2 were convalescent. The others were seen on the sixteenth and sixty-fourth day respectively.

EYELIDS.

The only lesion found on the lids themselves was an eruption of herpes on both lids of one eye, in an acute case at the end of the first week of illness.

Abnormalities of the palpebral fissures were noted in 17 cases. In 2 of these the only abnormality was inequality. In 2 cases the palpebral fissures were abnormally wide and at the same time unequal. In another, who had alternations of retraction and drooping of the lids, the inequality of the palpebral fissures disappeared when the lids were in a state of retraction. In another similar case the inequality was present both with drooping and with elevated lids. In this one the inequality was perhaps due

to weakness of the orbicularis, since voluntary efforts caused only partial closure of the wider palpebral fissure.

In none of the cases was there a drooping of one or both lids which could be described as ptosis.

Retraction of the Eyelids.

This was observed in 15 cases. It was observed as early as the fourth day, but most of the cases in which the symptom was well marked were the cases which had passed into the chronic stage. The most marked case of all, in which the sclera was well exposed both above and below the cornea, was that of a boy, seen the day of his death, who had been long in the chronic hydrocephalic state. Post mortem, no trace of exudate was found, but a great excess of clear fluid both in the ventricle and in the sub-arachnoid space. The patients in whom the symptom was observed in the early acute stage (4 in number) all died in the acute state. Seven of the 11 chronic cases have already died; 1 has definitely recovered; the other 3 are still in hospital. The case in which recovery took place is of some interest. The writer first saw her on the fifty-fourth day. She was then convalescent, but four weeks earlier she had had all the appearance of a chronic case likely to prove fatal. The retraction of the upper lids was very marked, 2 or 3 mm. of sclera being visible above each cornea. It was fairly constant, was still present a week later, but had disappeared by the sixty-seventh day. The retraction of the lids in this case was accompanied by typical von Gräfe's sign.

In 12 patients retraction of the lids was associated with dilated pupils, in which the light reflex was absent or very defective. In 1 case the pupils were small and inactive. In the other 2 cases the pupils were not investigated. In 3 it was associated with absence of the cilio-spinal reflex. In the fourth the latter was present in a slight degree.

Retraction of the lids was seldom a constant symptom, and it nearly always disappeared while the patient was asleep. In 1 case, in addition to the retraction of the lids a degree of exophthalmos seemed to be present.

Taking into consideration the facts above mentioned as to the further history of the cases in which this symptom was found, it would seem to be confined to cases in which the chance of recovery is small.

The cause of retraction of the lids is obscure. It is a recognized symptom of chronic hydrocephalus, and the majority of the cases above referred to might come under that heading.

In the acute cases it was never quite so marked, and in these cases it might be due to sympathetic irritation, either in the cilio-spinal centre or elsewhere in the sympathetic path to the eye. The dilated inactive state of the pupils would be quite in keeping with such an explanation. It is scarcely likely that sympathetic irritation plays a part in producing lid retraction in the later stages, in which the symptoms as a whole are referable more to the abnormal physical condition set up in the cerebro-spinal system than to inflammatory action. Tooth has suggested that it is a local manifestation of muscular rigidity analogous to head retraction, Kernig's sign, etc. The case I have mentioned, in which the symptom persisted well into the stage of convalescence, may lend some support to this, as it is not uncommon for stiffness of the neck and other manifestations of muscular rigidity to persist in a similar way after the patient is in other respects well. Increased intracranial pressure may be a necessary element in its causation. This is suggested by the frequency of its occurrence in chronic hydrocephalus from other causes. In 1 case of the present series the retraction, which was occasional, was associated with wrinkling of the forehead and complaint of increased frontal headache, and at the same time the eyes were turned strongly downwards and the pupils dilated and inactive.

Blepharospasm.

This was very frequent. In the great majority of the cases general hyperæsthesia was a marked symptom, and in the course of the eye examination this showed itself in the occurrence of a strong lid spasm, sometimes excited by the lightest touch upon the lids, more generally by attempts to separate the lids. This at first sight suggested photophobia and is probably the symptom sometimes described as such in cases of cerebro-spinal meningitis, but the writer never observed true photophobia in this series of cases. Spasmodic resistance to separation of the lids was almost the rule, but the patients could often be induced to open the eyes spontaneously, after which even prolonged ophthalmoscopic examination was tolerated so long as the lids were not touched. The absence of true photophobia is somewhat remarkable in view of the great general hyperæsthesia which is present in most of the cases. In one or two early acute cases the slightest touching of the eyelids set up a spasm of all the facial muscles. These occurrences were just as marked in unconscious as in conscious patients.

As a rule reflex blinking occurred on lightly stroking the eyelashes. Its absence was observed only in one hydrocephalic case a few days before death.

In one child who had repeated convulsive attacks, the left eyelids were involved in clonic spasms which affected the left side.

In 4 cases frequent winking was noted, each lid movement being accompanied by a jerky nystagmus-like movement of the eyeballs laterally or vertically.

Conjunctiva.

Hyperaemia of the bulbar and palpebral conjunctivæ occurred in many of the cases. A certain degree of bulbar injection is quite common, even in the first few days of the disease, and it may persist for some time.

Actual catarrhal conjunctivitis, with more or less purulent discharge, was found in 13 of the cases. In the majority it was a symptom of the early acute stage, but in several where it was first observed in the later stages, it might quite well have been due to outward infection from the incomplete closure of the lids, associated with a state of unconsciousness. No attempt was made to work out the bacteriology of these discharges. In the films taken from a few cases a number of organisms were found, but none closely resembling the typical meningococcus. Axenfeld, in his recently published work on the bacteriology of the eye, points out the difficulty of proving the identity of the meningococcus in conjunctival discharges, and indicates that only a few unequivocal positive findings have been made. Among these is that of J. Canby Robinson, who succeeded in cultivating the meningococcus from the discharge in one case of acute cerebro-meningitis.

Conjunctival hæmorrhages do not seem to have been hitherto described in cerebro-spinal meningitis, although hæmorrhages corresponding with the petechiæ in the skin are known to occur in many other situations throughout the body. Dr. MacGregor of Belvidere, who mentioned the symptom to me, saw conjunctival hæmorrhages quite frequently in the earlier cases of the Glasgow epidemic, usually in the acute stage, and even in the absence of such spots in the skin. I saw them in two cases of this series, one on the fourth day of the disease, no hæmorrhagic skin rash being present; the other on the day of death (thirty-fourth day of illness) associated with an abundant crop of cutaneous hæmorrhages. In two other cases of the series

conjunctival hæmorrhages had been present in an earlier period (third day and fourth day respectively), but had faded by the time of my examination. As conjunctival hæmorrhages are rare in acute illnesses, with the exception of whooping-cough, their presence in a patient suspected to be suffering from cerebro-spinal meningitis should carry a certain weight.

CORNEA.

In only one case was a corneal lesion present. This was a child seen the day before death—tenth day of illness. She lay unconscious, with eyelids half-closed; winking movements were infrequent and incomplete; the corneæ were rather insensitive, and each cornea presented a horizontally oval *ulcer* in its lower segment, obviously due to exposure. There was also abundant sero-purulent discharge.

The corneal reflex was tested for in 25 cases. It was only found to be quite absent in one, in which the other eye reflexes also were absent are very deficient. In two others the corneal reflex was present but deficient, one of these having corneal ulcers already referred to. Death occurred in these three cases.

UVEAL TRACT.

No evidence of iritis, cyclitis, or choroiditis was found in any of the cases.

PUPILS.

Abnormalities of the pupils were the most common symptoms. Thus only 6 out of 69 cases in which the pupils were examined had no pupillary abnormality. Three of them were acute cases in the fifth, tenth, and sixteenth days respectively.

Inequality of the pupils was noted eighteen times. In the great majority of cases where the pupils were unequal the pupil reflexes were deficient. In 2 of them one pupil showed the striking changes of size which will be referred to later, while the other pupil was more constant in size. In several others the reflexes were more active in one iris than in the other.

The size of the pupils was measured in 65 cases. Taking 3 to 5 mm. as the normal limits, dilated pupils were found in 34, contracted in 5, and normal in 26. When mydriasis was present, it usually had the characters of an "irritation" mydriasis, that is, dilated pupils with deficient contraction to light and in convergence, and no dilatation to sensory stimuli. In 2 of the cases, to these features was added some retraction of the eyelids. Fur-

ther evidence of a hypersensitive condition of the sympathetic reflex was afforded by the striking contrast in the size of the pupils in the waking and sleeping states. Pupils which during sleep were as small as 2.5 or 3 mm., would dilate on waking to about 7 mm. This is a larger change than would occur under normal conditions.

Changes in the size of the pupils were common. These were often merely due to *hippus* of the ordinary kind, a certain degree of which is often found in normal persons, but in many there were much larger changes of diameter, which occurred at intervals of seconds or minutes or even longer, and various gradations were found between the latter phenomenon and ordinary hippus. On the whole, the hippus observed in this series of cases was of greater amplitude than normal, and inclined to persist as long as illumination of the eye was maintained. It showed great variety in speed, in rhythm, and in amplitude, even in the same case. Hippus was noted as present in 31 and absent in 19 cases. The other phenomenon referred to was present in 29 cases. Many of these cases showed hippus, as well as the more occasional and more striking changes of diameter. These changes of diameter often had a range of 3 mm. or more. In 2 cases they were more distinct in one eye than in the other. They occurred independently of the illumination or distance of fixation object. Thus they sometimes occurred with perfectly steady fixation during indirect ophthalmoscopic examination. In the middle of such an examination of the pupil, which had been widely dilated, would suddenly and unexpectedly contract, and after an interval of seconds or minutes dilatation would occur again just as unexpectedly. This symptom, however, is not peculiar to cerebro-spinal meningitis. The writer has seen it in several cases proved by post-mortem examination to have been tuberculous.

PUPIL REFLEXES.

The light reflex was normal, or nearly so, in 24 cases, deficient as regards speed or amplitude or both in 26, absent in 7, and variable in its activity in 11.

The contraction of the pupil in *near vision* was good in 21, deficient in 15, absent in 7, and variable in 2. In 5 of the cases with deficient or absent reflex there was a corresponding deficiency of the faculty of convergence, which would account for the defect. The test for the convergence reflex could not be quite satisfactory, the results depend so much upon the visual

acuity and the mental condition of the patient. It was sometimes found, for instance, that while a child manifested no convergence or pupil contraction on being asked to fix the finger tip or handle of the ophthalmoscope, these reflexes were immediately elicited by a more interesting fixation subject, such as a penny.

The cilio-spinal reflex was present eighteen times and absent fourteen times.

The orbicularis reflex was present five times and absent seven times.

The pupil changes described by Squires as found in cases of basal meningitis (contraction when the head is flexed and dilatation when it is extended) were looked for in 3 cases, but not found.

Total absence of pupil reflexes with contracted (2 mm.) pupils was observed in 1 case on the day of death.

In some cases the activity of the reflexes varied in the course of the examination without obvious cause. In 1 case Cheyne-Stokes respiration was present at the time of examination, but no pupil changes were found to correspond with the different phases of the respiration.

None of the pupillary phenomena, with the exception of total absence of the reflexes, seemed to be of any value as regards diagnosis or prognosis.

ACCOMMODATION.

It was only possible to test the accommodation in 7 cases, and in none of them was it defective.

STRABISMUS.

Strabismus was found in 15 cases. Eight others had a history of squinting or diplopia, either before or after admission to hospital.

It is noteworthy that in only 1 of the 15 cases observed by the writer was evidence found that the squint was a paralytic one (paralysis of both external recti). This contrasts with the state of affairs in other forms of meningitis, tuberculous for example, in which paralytic squints are much more common.

It was difficult in some cases to say whether the squint had existed at an earlier date or was a symptom of the disease. In 1 case, although the amplitude of the squint (convergent) varied from time to time, the fact that the eyes moved conjugately, with no apparent limitation in any one direction, suggested that it was a pre-existing concomitant squint.

In 3 others convergent squinting alone was observed. It was spasmodic in character, not constantly present, and varying in degree. In 1 of these cases the squinting eye sometimes turned into its position of greatest convergence by a series of rapid jerky movements. This patient, who died three days after the observation, was found to have suffered from a combination of tuberculous and meningococcal infection.

In the other 10 cases the squint was either entirely divergent or varied from convergence to divergence. All were variable in degree and not constantly present. In some the condition was quite evidently a spasmodic one, passing from one eye to the other, or affecting both eyes simultaneously. Some of these cases might perhaps be better described as examples of dissociated movements, since various degrees of convergence and divergence occurred in rapid succession, owing to independent movements of the eyeballs.

In 4 cases of divergent strabismus; the divergence only occurred when the patient was unconscious or asleep. These were probably only examples of the divergence which constitutes the resting position of the visual axes.

From the histories of cases of cerebro-spinal meningitis, it would seem that squints of various kinds, transient and probably spasmodic, are not uncommon among the symptoms of the period of onset.

THE OCULAR MOVEMENTS.

The *conjugate movements* of the eyes were noted as normal in 41 cases.

Constant conjugated *rolling of the eyes* from side to side was present in 1 case in the hydrocephalic stage.

Conjugate deviation of the eyes was found in 4 cases. In 1 of these it occurred in the course of a unilateral convulsion, at first towards the convulsed side, and later towards the unaffected side.

Convergence was normally performed in 25 cases, deficient in 9 and absent in 3. Two of the deficient cases were myopic. In some the defect was due to mental apathy, in others to visual defect making the test unsatisfactory. Often there was a combination of the two circumstances. This difficulty has already been noticed in connection with the reflex contraction of the pupil in near vision.

Nystagmus was found 7 times. In 2 of these it was *vertical* and occasional; in 1 it was vertical and constant. In 1 case

rotary nystagmus was found. In 1 of the cases exhibiting occasional vertical nystagmus and in 3 others a symptom was present which consisted of rapid winking movements of the lids, each wink being accompanied by a jerky movement of both eyes to one or other side or even in a vertical direction. Nystagmus seems to occur only in severe cases. Of the 7 in whom it was observed 2 had relapsed into the chronic stage, and the other 5 died a few days after the symptom was noted.

Pseudo-nystagmus, or jerky movement of the eyes at the limits of the field of fixation, was seen in 5 cases. It appeared to have no significance.

VISION.

It was very difficult to get any reliable information as to the state of vision, but when the patient could not be tested with types, he was considered to have good vision if he recognized small objects, followed the finger, etc.

In this sense vision was good in 34, in 12 it was defective, in 9 absent, and in 7 it varied between very deficient and absent in the course of the examination. One case of defective vision was a high myopia with choroidal atrophy.

The visual defect was seldom to be entirely explained by any condition discovered by the ophthalmoscope, but in 2 cases in which vision was abolished there was optic neuritis. In a third the discs were congested, their margins blurred, and the veins full.

The cause of the visual defect in most of the cases must probably be looked for in the higher centres, although amblyopia or amaurosis was never found associated with perfect pupil reactions.

None of the convalescent case in this series had any notable defect of vision.

OPHTHALMOSCOPIC CHANGES.

Ophthalmoscopic examination was made in 61 cases.

Double optic neuritis, well marked, was found in 5 cases.

One of these, who was seen on the fourteenth day of his illness, died on the seventeenth day, and was found post mortem to have been suffering from a combination of tuberculous diplococcal meningitis.

Another, a boy of 11, after apparent recovery, had relapsed into a chronic illness, with repeated attacks of sickness, head retraction, and other symptoms. The optic neuritis was seen at

two examinations on the twenty-second and forty-third days respectively.

The third case, a man of 21 years, when first seen (on the thirtieth day of his illness, was apparently convalescing, but he suffered a relapse. On the forty-ninth day the posterior fossa was trephined for drainage. Ophthalmoscopic examination was repeated on the fifty-first day, and the optic neuritis found to be unchanged.

The fourth case was a child aged 4, who had been in hospital for about four months at the time of the examination. Post mortem he was found to have marked internal hydrocephalus.

The fifth case was a man aged 20, whose history was that he had suffered for some weeks from indefinite symptoms of illness, chiefly pains in the head and neck, attributed to influenza. Sudden increase in the severity of the symptoms caused him to leave work and seek admission to hospital. The ophthalmoscopic examination was made on the twelfth day of the acute illness. Besides the well-marked double optic neuritis, there was in the left eye a moderately large flame-shaped hæmorrhage passing across the upper inner edge of the swollen disc.

Besides the 5 cases of well-marked optic neuritis there were 9 cases in which blurring of the disc margins, congestion of the discs, and fullness or tortuosity of the vessels raised a suspicion of optic neuritis. These observations were made at periods ranging from the fifth day (3 cases) to the one hundred and eighty-first day, and they were not cases of unusual severity. In the very chronic case referred to, the swelling of the optic nerve, which was definite though slight, was more marked in the right eye, and was not always present to the same degree.

In a number of patients the fundus presented the highly-colored disc, full veins, and tortuous arteries so often met with in fever from any cause. In 2 of the 5 cases of optic neuritis the vision was defective; in 2 of them absent. Among the 9 other cases the vision was, on the whole, poor, but not more so than among all the cases of the series.

In 2 cases, one of them highly myopic, extensive choroidal atrophy of old standing was present. With the exception of the retinal hæmorrhage already mentioned, no other abnormality of the fundus was observed.

In no case was there any obscuration of the fundus from disturbances of the media other than corneal nebulae which existed prior to the present illness.

CONCLUSION.

It will naturally be asked whether the ocular symptoms of cerebro-spinal meningitis are likely to afford any help in diagnosis or prognosis. The frequency of the presence of eye symptoms shows that it is worth while to have the eye frequently and carefully examined.

Perhaps the most striking feature of these cases is the great variation in the symptoms—squint, retractions of the lids, sizes and reactions of the pupils, vision, etc.—in the same patient from day to day, and even in the course of a single examination. This is brought out by the records of the writer's own examinations as detailed above, but even more markedly by comparison of these with the notes made from time to time in the hospital journals. In this respect cases of cerebro-spinal meningitis seem to the writer to differ somewhat from other forms of meningitis.

As conjunctival hæmorrhages, so far as one is aware, do not occur at the onset of other acute febrile illnesses, their presence might afford a useful aid in diagnosis. The same may perhaps be said of herpes of the lids. This has been seen to occur, and it is quite conceivable that it might occur on the eyelids alone or even on the cornea, among the earlier symptoms.

The conjunctivitis, which also occurs as an early symptom, would be most likely to assist in distinguishing cerebro-spinal from other forms of meningitis. Unfortunately the examination of conjunctival smears for the organism is of little value, as nothing short of careful cultural tests is sufficient to prove the identity of the meningococcus in these discharges.—(*British Med. Journal.*)

PURULENT AND NON-DIPHThERITIC PSEUDO-MEMBRANOUS OPHTHALMIAS CURED BY MEANS OF ANTIDIPHThERITIC SERUM.*

By DR. CAMILLE FROMAGET.

(Translated by Adolf Alt, M.D.)

The brilliant results which the antidiphtheritic serum therapy has given in cases of serious pneumococcus keratitis have led me to resort to this process of defense to combat the grave purulent ophthalmias which may be due to the same pathogenic agent. The pneumococcus ophthalmia may take on grave forms, as Cooper has already stated and as we have had occasion to observe. It is, however, impossible to formulate a special clinical type for each agent, and each microbe according to circumstances can lead to benign and to grave forms of inflammation. We have observed two very instructive cases of purulent pseudo-membranous pneumococcic conjunctivitis which were cured with antidiphtheritic serum in such a remarkable manner that I feel that I ought to publish them without waiting for an accumulation of further material.

The following are the conditions which induced me to make these serotherapeutic attempts:

A three year old child was brought to consult me at the Pasteur Clinic in the beginning of June on account of a most intense double purulent ophthalmia. There was an enormous œdema of the upper eyelids, and an abundant amount of pus flowing from the eyes. When the lids were turned the conjunctiva was seen to be covered with pseudo-membranes, the cornea was still unaffected. I instituted the ordinary treatment of permanganate of potash lavages, and repeated instillations of argyrol. But as no improvement took place and as I suspected that the affection might be of a diphtheritic nature, I made on Saturday, June 15th, at noon, an injection of 10 cubic centimetres of antidiphtheritic serum. The next morning at 10 o'clock the child opened both eyes and half of the pseudo-membranes was gone. On Monday, the 17th, 48 hours after, healing was complete. Not only had the pseudo-membranes disappeared, but the suppuration was dried up and the patient used nothing but hot water. The cure has remained permanent.

I must acknowledge that with such a remarkable result I believed that I had had to deal with a diphtheritic conjunctivitis and

*Annales d' Oculistique, September, 1907.

that my astonishment was great when the examination of the pus and the cultures made at Professor Ferre's laboratory showed that it was a *pneumococcic conjunctivitis*. Remembering the results obtained in cases of keratitis of the same origin, I thought that here we had a therapeutic agent of the highest class to try in cases of grave purulent ophthalmias of whatever origin. A further and still more serious case proved that I was right.

On July 11th, I was asked by my excellent friend and colleague, Dr. Quinril, to see one of his relatives, a newly born child 3 days old, suffering from a serious purulent conjunctivitis. I found an ophthalmia having appeared in both eyes on the third day. The eyelids were greatly swollen, a lemon-colored pus flowed abundantly from the palpebral fissure and when the lids were everted they were found to be covered with very adhesive gray pseudo-membranes. This interstitial pseudo-membranous form made me give a grave prognosis although the corneæ were still unaffected. Being far from any place where an examination could have been made and not being able to know the pathogenic agent causing the affection I advised the physician attending the child to make at the earliest possible time an injection of five cubic centimetres of antidiphtheritic serum. The next morning at 11 o'clock the injection was made. But in the night a dangerous complication arose, the whole lower half of each cornea was invaded and the physician, being alarmed by this, sent the child to Bordeaux, where I took care of it.

The injection arrested the inflammatory symptoms almost immediately. When I saw the child 24 hours later everything was modified. The astonished family had seen the œdema of the lids disappear before their eyes. The false membranes had to a great part melted away and there was hardly any suppuration. The next morning, 48 hours after, the oedema was gone, there were no more false membranes, and the infiltrated parts of the corneæ had sloughed off. The ulcers were superficial and clean, as if cut out with a gouge. At this time the purulent conjunctivitis was cured and our treatment confined itself to the taking care of the keratitis by very weak permanganate of potash lavages and the application of yellow ointment. Thanks to the absolute absence of any conjunctival suppuration the corneal ulcers which were enormous, occupying as they did, the whole lower half of each cornea, healed very nicely, leaving thin leucomata, and the child left the hospital on August 3d, 1907. The bacteriologic examination made during the time of treat-

ment showed this purulent conjunctivitis to have been due to the pneumococcus and staphylococcus.

Here are two cases of pure or mixed purulent pneumococcic conjunctivitis in which the serum therapy has given as remarkable results as if they had been cases of diphtheritic ophthalmia. Therefore the serum must have other than purely specific properties and we have here what Darier calls a 'non-specific serotherapy'. It possesses the faculty of enhancing the defence of the organism against localized infections which are, perhaps, much more numerous than we suppose. Since the same result has been obtained with the antitetanic serum, it would be extremely interesting to know whether is not due to a *peculiarity of the serum taken from the horse and whether injections of serum from a non-immunized horse* would not give as good results. These points are so important that they can be solved only after numerous and conclusive experiments.

Whatever it be, the facts which we have just related allow us to affirm that we have a new therapeutic agent for the cure of ophthalmias other than diphtheritic, in which the results have been so excellent. This remedy might be tried in every case of grave aspect presenting itself to the clinician. It is an unoffensive remedy and the newly-born bear without any inconvenience five cubic centimetres of serum. This remedy is in the hands of all physicians and should be used before a bacteriologic examination is made.

It will be interesting to study its effect according to whether we have to deal with the gonococcus, staphylococcus, streptococcus, pneumococcus, and so on. In this manner we will have realized a veritable progress in the treatment of the purulent ophthalmias which still do too much harm to the adult as well as the newly born. At present, I just wanted to make known the happy results which I obtained when it was impossible to expect them.

MEDICAL SOCIETIES.

MEETING OF THE OPHTHALMIC SECTION ST. LOUIS MEDICAL SOCIETY.

May 8, 1907.

DR. BARCK, CHAIRMAN, PRESIDING.

PRESENTATION OF PATIENTS.

Glaucoma Secondary to Injury. Dr. H. Muetze: A brakeman, 23 years old, came under observation February 28th, 1906, with the following history: On March 4th, 1905, he had sustained an almost central perforating wound of the cornea by the bursting of a water-glass. After healing, vision was sufficient to enable him to observe large objects, but gradually grew worse, and the eye became "bloodshot." Examination showed the eyeball uniformly enlarged; marked pericorneal injection; a large, almost central leucoma of the cornea, with adherent iris and pupil widely dilated. Tension plus 1; V.= movement of hand at six inches. The ophthalmoscope revealed atrophy of the optic nerve. The patient was placed on potassium iodide and mercury internally, with instillations of pilocarpine and eserine. The pupil contracted well; the tension became lower, and the congestion diminished. Against advice, the patient returned to work. May 1st, 1907, he returned with all the previous signs greatly exaggerated. Vision was completely abolished. It is worthy of note that the patient has never had any pain in the eye or the right side of the head except a momentary twinge in the right temple several days ago.

Exophthalmos, with Paresis of External Rectus. Dr. J. C. Buckwalter: Female, 63 years of age, came under observation a year ago. The complaints were of impaired vision, transient diplopia, drooping of the upper lid, and pain. All these symptoms cleared up and she passed from observation. Eight weeks ago, she again consulted me, at which time I found moderate exophthalmos and slight convergent squint; vision normal. With her glasses she read 20/20 and No. 2 Jaeger. Urine negative. Ophthalmoscopic examination negative.

Case of Cataract and Choroidal Coloboma(?). Dr. J. E. Jennings: This young man, when a boy of five, was struck in the right eye, sustaining injury of the iris and lens. We see now as the result a slight circumscribed opacity of the lens. With the ophthalmoscope we find peripherally a large patch of what appears to be a coloboma. Just what connection this wound of the lens has with the coloboma it is difficult to say. It may be due to the injury, but if so is unusual, considering the transparency of the lens.

PAPER.

Dressings after Intra-ocular Operations. Dr. C. Barck: Whilst the roller bandage, introduced by Græfe, remained the standard dressing for nearly half a century, within the last twenty years a number of new methods have been recommended and tried. These can be classified under three categories, which the author terms the "strip," the "free," and the "open" methods, respectively. In the first, the lids are covered with a strip of isinglass plaster only; in the second, the lids are free, but the eye is protected from injury by some kind of a shield or mask; in the third, the eye is left open without any protection whatever. The paper discusses at length the advantages and disadvantages of the bandage, and of the three new methods, and arrives at the following conclusions: The idea of restricting the motions of the eye by the bandage is erroneous; this rather interferes with the quick and regular closure of the wound. A gentle closure of the lids is beneficial; it does not, as maintained by some, interfere with the regular flow of the tears, and increase thereby the danger of secondary infection. Furthermore, protection of the operated organ against gross insults is a surgical demand. The author, therefore, rejects the bandage, (with exceptions, of course), and rejects the strip and the open methods. For final selection, he discusses the free method (as practiced now frequently in Europe), and a combination of the free and strip methods, and finally decides in favor of the latter. "The lids are covered with a thin layer of gauze and cotton, or cotton alone, which is held by a strip of adhesive plaster running from the forehead to the cheek. Over this is placed a shield, which is held by a strip running from the nose to the temple. At the dressings, only the upper parts of the plaster are detached and are afterwards reapplied." As a shield, he prefers an aluminum shield, as shown, to the Fuchs' wire mask.

DISCUSSION.

Dr. Buckwalter stated that after cataract operations he smears sterilized vaseline over the lids, then places a piece of sterilized gauze, over this a piece of cotton, and plasters the cotton down with collodion.

Dr. Williamson spoke of the advantages of the double wire mask of Fuchs, which covers both eyes and fits well down over the cheek and nose, thus offering a better protection during the post-operative treatment than the aluminum mask of Dr. Barck.

Dr. Alt stated that he does not use any mask, but a cotton pledget moistened with bichloride solution and adhesive plaster. He has a ribbon tied to one wrist of the patient, passed in under the back and then tied to the other wrist, so that any attempt during sleep to raise the hands to the eye inevitably wakens the patient.

Dr. Saxl discussed various methods of dressing obtaining in the clinics of Vienna, Zurich, Basle, and Paris.

Dr. Green called attention to the advantages of the Ring mask, dwelling especially on the possibility of shaping it to the contour of the patient's face, and to the use of adhesive strips across the forehead, holding it more securely in position.

PAPER.—“Notes on the Bacteriology of Conjunctival inflammations.”—Dr. W. H. Luedde. The writer emphasizes the desirability of frequent and regular examinations to determine the bacteriological causes present in the various types of inflammatory diseases of the conjunctiva and cornea. Reference was made to methods in vogue at the Fondation Ophthalmologique de Rothschild at Paris. Tables presented showed the Weeks bacillus present in 71 cases out of 226 cases diagnosticated as acute conjunctivitis, but only three times in 265 cases of “chronic” conjunctivitis.

The diplobacillus of Morax-Axenfeld was present only 24 times in 226 “acute”; but 102 times (or in 38½%) in 265 “chronic” cases examined at Paris.

In a smaller number of examinations made in St. Louis, in private practice, the bacillus of Weeks was present in 11% of the acute cases, and not found at all in the chronic cases. The diplobacillus of Morax-Axenfeld was found in 22% of the acute, and in 30% of the chronic cases. The value of the examination of “smears”, easily and rapidly made, was insisted on as being a thing very much worth while, even for the busy practitioner.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.,

ST. LOUIS, MO.

LOSS OF VITREOUS HUMOR IN THE OPERATION FOR EXTRACTION OF CATARACT.

ITS IMMEDIATE AND REMOTE EFFECT.

J. Morrison Ray (*Jr. A. M. A.*, July 6), from a careful review of this subject, offers the following conclusions:

1. Loss of vitreous at the time of extraction adds to the danger of primary infection, this danger being irrespective of the quantity of vitreous lost, but depending largely on the care used in the preparation of the field of operation.

2. The danger of iridocyclitis during the stage of healing is materially increased by loss of vitreous. The increased activity in the blood-vessels and lymphatics during the repair of the traumatism necessary to the operation for cataract being overtaxed, excites changes in the iris and ciliary body that end in hyalitis, with closing of the pupillary space and anterior phthisis.

3. When vitreous is once lost the material taking its place is probably aqueous, the framework is never reformed and the vitreous becomes fluid throughout. Floating particles increase in amount as time goes by, fibrillary bands are thrown out from the retina to take the place of the reticulum of the vitreous. These bands contract, causing minus tension and retinal detachments, followed by the characteristic square atrophied eye due to the action of the recti muscles on the softened globe.

DOES THE OPACITY OF INCIPIENT CATARACT EVER REGAIN TRANSPARENCY?

Leartus Connor (*Jr. A. M. A.*, July 6), in a study of this subject, reports six cases in which he had observed the striæ of incipient cataracts partially or wholly disappear, with decided improvement of vision. The development of senile cataract and the regaining transparency of the lens, when it does occur, are very closely related to the nutrition of the lens. In the development of lens opacities the cause may be within the eye, e. g., a choroiditis, by which the lymph which nourishes the lens is polluted, the action of the capsule cells disturbed, or the intraocu-

lar circulation of blood and lymph deranged; or the trouble may be without the eye, e. g., in diabetes, renal disease or arteriosclerosis, by which the quality or quantity of blood and lymph going to and from the eye or the innervation is changed. A closer study of conditions which affect the transparency of the lens is necessary.

Connor addressed a letter of inquiry to a number of ophthalmic surgeons as to whether they had ever observed "the opacity of incipient cataract regain transparency," and gives the following summary of observations:

"Ten observers report twenty-three cases in which they have seen striæ of incipient cataract disappear from one or both lenses, taking with them the diffuse opacity.

"Twenty-six observers report about eighty-four cases in which they have seen the diffuse opacity of the lens in incipient cataract regain transparency—no mention being made of striæ.

"Fourteen observers report thirty-three cases of incipient cataract regaining partial transparency.

"Thus, including my cases, fifty-one observers report about one hundred and forty-seven cases, in which the opacity of incipient cataract has regained transparency in whole or in part."

TUBERCULOSIS OF THE EYE AND ITS TREATMENT.

Helbron (*Berliner Klinische Wochenschrift*, July 15), in 15,000 patients at the Berlin Eye Clinic, found .5 per cent suffering with some form of tuberculosis of the eye. The prognosis, particularly when the disease is readily accessible, is much better than is generally supposed. The tuberculous process usually remains local and recovery generally takes place, with some impairment of function, except in what he terms "conglomerate tuberculosis" in which form there is always danger of general infection and tuberculous meningitis. The results of the tuberculin treatment which was extensively used were inconclusive. He advises local excision and general measures.

DIAGNOSIS AND TREATMENT OF IRITIS.

Heine (*Deutsche Medizinische Wochenschrift*, Sept. 5), thinks that we should always consider iritis a serious condition and confine the patient to his bed or at least to his room, forbidding all physical exercise. Gentle purgation, and moist heat are indicated and cupping sometimes is of service. Stimulants

should be avoided, while diaphoretic and sweat baths do good often. Salicylates should be given internally unless syphilis is suspected, when mercurial inunctions and potassium iodide should be pushed. Scrofulous and tuberculous persons should be given tonics, and tuberculin sometimes has a beneficial influence, but should be given in small doses, never causing a febrile reaction, and continued over a long period. In mixed infections he uses both the mercurial inunctions and the tuberculin injections.

CATARACT TREATED BY POTASSIUM IODIDE.

Bourgeois (*Revue française de médecine et de chirurgie*, Aug. 10, 1906), recommends the use of 2.5 per cent. solution of potassium iodide locally in cases of incipient cataract. The eye is bathed with this solution by means of an eyecup for one or two minutes at a time. He has found this treatment useful only in the beginning of the lens changes, before the opacity has progressed to any marked extent, and it should be instituted as soon as the patient notices a failing of his vision.

LESIONS OF THE TRIGEMINAL NERVE.

Parsons (*Lancet*, May 25, 1907) believes that ophthalmic herpes is caused by definite lesions in the Gasserian ganglion, which ganglion corresponds to a dorsal root ganglion. The trouble frequently begins with an elevation of temperature. While herpes febrilis in its distribution is not confined to the area supplied by certain nerves to the same extent as in herpes zoster, yet it is likely that the lesion causing the eruption is located in the ganglia of the peripheral sensory nerves. Since herpes zoster is caused by a concentrated attack upon certain dorsal root ganglia it is reasonable to suppose that herpes febrilis and this class of affections of the cornea are the result of a less acute, more disseminated attack of a similar nature. Neuroparalytic keratitis comes from some irritation of the cut or diseased trigeminal nerve.

TRAUMATIC ŒDEMA OF THE CORNEA IN THE NEW BORN INFANT.

Aaron Brav (*N. Y. Med. Jr.*, Sept. 14, 1907) reports an interesting case of œdema of the cornea of a new born babe, the result of pressure exerted by instruments during delivery. He saw

the case thirty-six hours after the delivery and found the left eye proptosed and a small subconjunctival hæmorrhage below the cornea. The cornea was conical, with the summit in the center, was smooth and of shining lustre, but the whole cornea with the exception of about 3 mm. of the periphery was covered with a bluish white opacity which was most dense in the center. The iris could be seen through the clear periphery and reacted to light. There was no chemosis of the conjunctiva nor sign of inflammation. Besides œdema of the cornea the following conditions were to be thought of: (1) Congenital corneal opacities resulting from a keratitis in utero; (2) anomalies of the cornea due to faulty embryonic development; (3) keratitis superficialis; and (4) hydrophthalmus. The diagnosis was made by exclusion after several days, as the cornea cleared up very rapidly while in the other conditions mentioned it would have cleared much more slowly or not at all. Œdema of the cornea does not need much treatment as nature will restore the normal condition in a short time. The author used in this case a 1 per cent. solution of dionin and thinks it was of some use.

METASTATIC CONJUNCTIVITIS IN GONORRHOEA.

James J. Carroll (*Jour. A. M. A.*, July 13) calls attention to the fact that, while previous to 1736, when Astruc published the report of a case of purulent conjunctivitis, which he believed to be due to direct infection, by the hands, from the urethra, and in fact, until in 1841, the experiments of Piringer demonstrated positively that gonorrhoeal conjunctivitis was caused by direct infection by secretion from the urethra, it was generally believed and taught that the conjunctivitis was produced by the venereal virus reaching the eye through an internal or indirect route. After Piringer's experiments the pendulum swung to the opposite extreme and it was taught that all gonorrhoeal infections of the conjunctiva were due to direct infection.

Recently it is recognized that although the majority of the cases are due to exogenous infection, there, nevertheless, are some cases in which there has been no direct infection, but in which the poison reaches the eye through an indirect or internal route,—endogenous infection.

Carroll reports two cases of this latter type, basing his diagnosis of metastatic conjunctivitis on the following points:

1. The existence of a urethritis with gonococci; 2, the character of the conjunctivitis; 3. the absence of gonococci in the conjunctival secretion; 4. the presence of polyarthritis; and 5. slight, but appreciable systemic disturbance and accompanying iritis in the second case.

The inflammation involves the conjunctiva of the fornix and eyeball, mostly, causing much redness and swelling, at some times chemosis. The secretion is rather scanty and is mucoid or mucopurulent, containing no gonococci. Subjectively there are present photophobia, lacrimation, slight soreness of the eye and sometimes pain. Unless the deeper structures are involved vision is not affected. Both eyes are affected at the same time or one shortly after the other, iritis or iridocyclitis frequently accompany or follow the conjunctivitis. The uveal involvement is generally of the serous or plastic type. A recurrence of the disease is frequent. The differential diagnosis must be made between it and the ordinary gonorrhoeal conjunctivitis of the adult and acute catarrhal conjunctivitis.

Three theories are advanced concerning the nature of the infection. 1. That the gonococci are carried to the conjunctiva by the blood-vessels and there set up an inflammation by their presence and growth. 2. That the gonococci, by their presence, prepare the soil for other micro-organisms as the staphylococcus, streptococcus and pneumococcus, a mixed infection resulting. 3. That neither the gonococcus nor other micro-organisms are necessarily present in the conjunctiva but that the inflammation is due to the action of the toxins of this organism. The author accepts this theory.

PHLEGMON OF THE ORBIT, SIMULATING A MALIGNANT GROWTH AND ITS ORIGIN FROM THE ETHMOID CELLS.

Dunbar Roy (*Brit. Med. Jr.*, Dec. 29, 1906,) reports two cases of phlegmon of the orbit, resulting from suppuration of the ethmoid sinuses. The first case was of a chronic nature, beginning with pain in the eye and protrusion of the globe. The exophthalmus gradually increased for a period of two years. When the author first saw the case all vision of this eye had disappeared two months previously, and at that time he complained of no pain. The globe and orbital contents protruded outward, downward, and forward for half an inch. There was great

œdema of the palpebral and ocular conjunctiva. The cornea was anesthetic and the pupil widely dilated. The fundus appeared normal, except that the disc looked a little pale. As no distinct fluctuation could be obtained, from the history of the case the author concluded it was a sarcoma of the orbit and expected to do a complete exenteration of the orbit, but was surprised, on making an opening through the conjunctiva beneath the rim of the orbit, to have a gush of pus follow, revealing an orbital abscess. The ethmoidal wall was found completely broken down and the cells disintegrated. The proper treatment resulted in the parts rapidly assuming their normal appearance and the patient was dismissed from the hospital in two weeks with 20/40 vision in this eye and the pupillary reflexes good.

The second case was of an acute type. One week from the beginning of the trouble marked exophthalmus, complete ptosis, and great chemosis of the bulbar conjunctiva were present and the vision was only 20/40. Examination showed suppuration of both frontal and ethmoidal sinuses. External operation was refused and so treatment was begun through the nose, the middle turbinate being resected, the ethmoidal cells curetted, and the frontal sinus thoroughly irrigated. Under this treatment in one month's time the eye and orbital cavity appeared normal and vision was 20/20. There was no return of the trouble.

Roy refers to the anatomical investigations of Onodi and the articles of Axenfeld and H. Snellen, Jr., which show the close relationship between the accessory sinuses and the orbit and the importance of the ophthalmologist of to-day being familiar with the recognition and treatment of sinus diseases. He agrees with Axenfeld that orbital abscess may be caused by suppuration of the frontal and ethmoidal sinuses without the destruction of the wall separating these cavities from the orbit. In these cases the infection travels along the emissory veins and nerves or by means of a thrombo-phlebitis.

The diagnosis between a chronic orbital abscess and a malignant growth in the same position may sometimes be difficult. Roy's experience leads him to attach considerable importance to the presence of marked chemosis of the conjunctiva, as he believes this is not nearly so pronounced in the latter as in the former.

DIONIN IN OPHTHALMIC PRACTICE.

James Hinshelwood (*Brit. Med. Jr.*, May 12, 1906), having used dionin extensively in ophthalmic practice in both hospital and private patients, finds it of great value in quite a variety of conditions. While it is in no sense an anesthetic, yet as an ocular analgesic it easily holds first place. He conducted a series of experiments with three solutions—5 per cent. cocain, 1 per cent. holocain, and 5 per cent. dionin, to determine the degree and duration of relief afforded to the patient from pain the result of ocular disease. Dionin proved by far the most satisfactory both as to regards the degree and also the duration. Holocain was second while cocain was a long way inferior to both. Another thing greatly in its favor is that it can do no harm, whereas cocain has been known to set up an attack of inflammatory glaucoma. Its possible effect the first time it is used should be explained to patients as otherwise the pronounced chemosis which it sometimes causes might greatly alarm them.

The pain accompanying iritis, iridocyclitis, glaucoma, ulcer of the cornea or keratitis may frequently be completely relieved by the use of dionin, not recurring again often for hours.

In the treatment of keratitis where there is much infiltration he always combines with atropin 1 or 2 per cent. of dionin and finds that it not only lessens the pain but that the corneal infiltrate clears up more rapidly. After the inflammatory symptoms have subsided he stops the atropin, but still continues the dionin. He has found it of particular value in cases of interstitial or parenchymatous keratitis. Corneal opacities, when recent, are often cleared up remarkably, and even in cases of long standing good results may sometimes be obtained. He considers it the most powerful means at our disposal for clearing corneal opacities.

Another class of cases in which he has found it of great service is that in which careful examination of the eyes reveals no inflammation nor abnormality, but the patient, usually a neurotic or neurasthenic, complains of a constant feeling of soreness and discomfort in the eyes. In these cases he has found that a weak solution of dionin (1 or 2 per cent. at most) used three or four times daily, gives considerable relief and rest from the symptoms. Cases suffering from ocular pain due to eyestrain are sometimes helped by these weak solutions and he has found that the testing for glasses can be done with less discomfort to these sensitive

patients after several days rest of the eyes and use of the drops.

Hinshelwood advises beginning with a 1 or 2 per cent solution, to be followed by 5 per cent. or even stronger as tolerance is established. When used for corneal opacities it should be used as an ointment, gently rubbing it over the cornea with the closed lids.